HONOLULU
LA JOLLA
MONTEREY
TIBURON

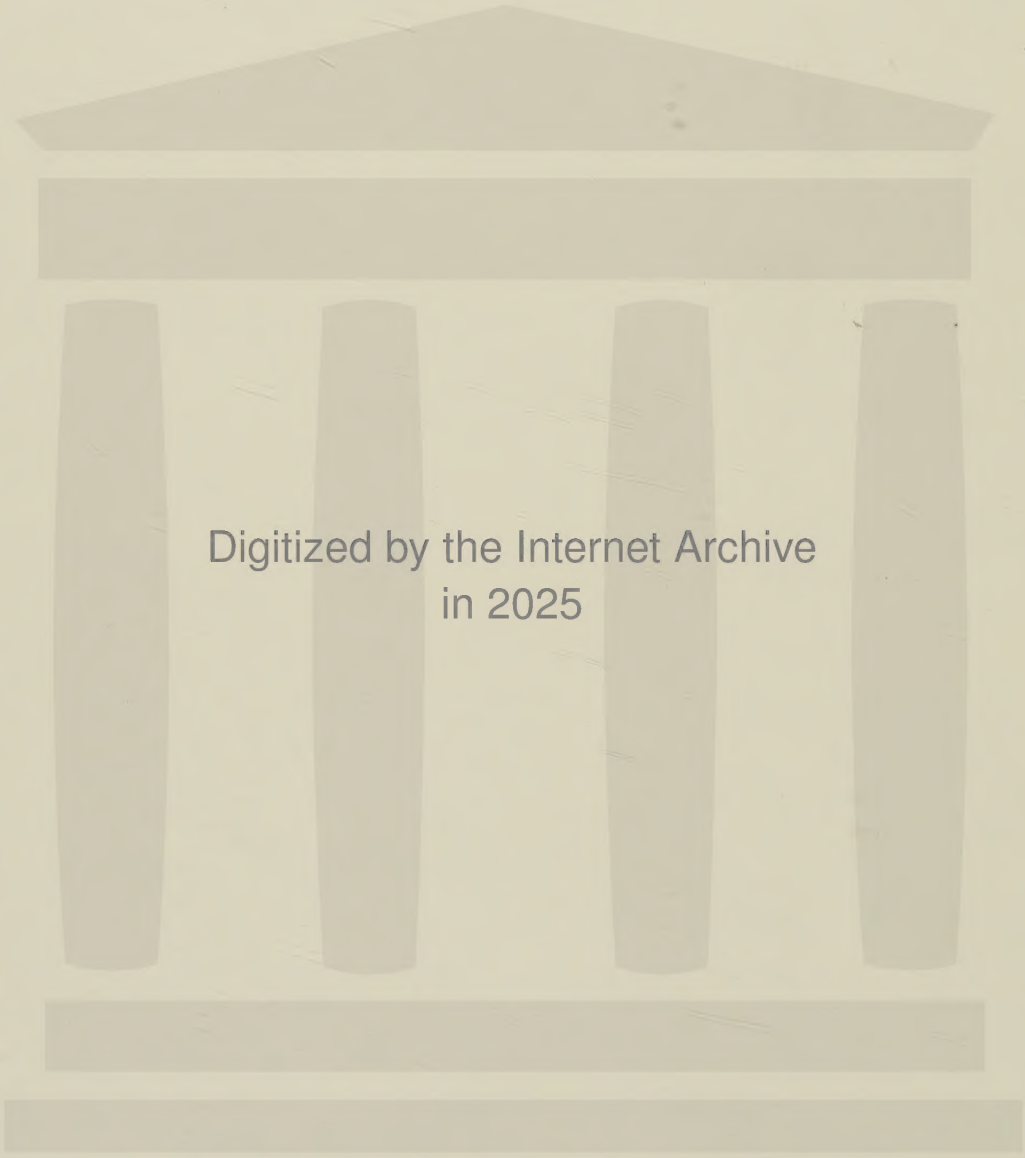
SOUTHWEST FISHERIES CENTER

MONTHLY REPORT - NOVEMBER 1977

RESEARCH HIGHLIGHTS

	Page
Townsend Cromwell Returns from Northwestern Hawaiian Islands Cruise	4
Public Hearings on Anchovy Fishery Management Plan to Begin in January 1978	5
Descriptions of Formation and Development of Organs Compiled for Larval Mackerel and Anchovy to Estimate Incidence of Starvation	9
U.S.-Mexico Plan Cooperative Fisheries Research in the California Current	12
Center Staff Participates in CalCOFI Conference	15
Tuna Seiner Committed to Porpoise/Tuna Research for One Year	16
Biological Sampling of Foreign Imports of Atlantic Tunas Continues in Puerto Rico	18
Anomalous Salinity Distribution May Indicate Changes in Oceanographic Circulation Affecting Fish Distribution	20
Workshop on Determining Age of Rockfishes Held at the Tiburon Laboratory	22
Experimental Midwater Trawling Gear Installed Aboard Fishing Vessel	23
Experiments Indicate Striped Bass Thrive Best on Young Neomysis Shrimp	24
Effects of Crude Oil on Flounder and Clam Tissues Examined	25
Southwest Fisheries Center is Site of Colloquium on California Fishery Production	31

NOAA/NMFS



Digitized by the Internet Archive
in 2025

https://archive.org/details/administrative-report-lj_1977-11

SOUTHWEST FISHERIES CENTER
La Jolla, California

Honolulu Laboratory
La Jolla Laboratory
Tiburon Laboratory
Pacific Environmental Group

MONTHLY REPORT - NOVEMBER 1977

STATUS OF PUBLICATIONS

Published

Benville, P. and S. Korn. 1977. Acute toxicity of six monocyclic aromatic crude oil components to striped bass (Morone saxatilis) and bay shrimp (Crago franciscorum). Calif. Fish Game 63(4):204-209.

The acute toxicities of benzene, toluene, ethylbenzene, p-xylene, m-xylene, and o-xylene were determined for striped bass and bay shrimp by static bioassay. The 96-hr LC_{50}'s ranged from 2.0 to 11 µl/l (ppm) for striped bass and from 0.49 to 20 µl/l (ppm) for bay shrimp. Solubilities of these aromatics were determined by gas chromatography in 16 C (61 F) seawater with a salinity of 25 ppt as part of our procedure for dosing the animals. The solubilities were 1400, 330, 180, 210, and 230 µl/l (ppm), respectively, which is high enough to be lethal to striped bass and bay shrimp. The toxic effect of the aromatics was more latent in shrimp than in fish as demonstrated by the difference in the 24- and 96-hr tests.

Dizon, Andrew E. 1977. Effect of dissolved oxygen concentration and salinity on swimming speed of two species of tunas. Fishery Bulletin, U.S. 75(3):649-653.

Hobson, E.S. and W.H. Lenarz (eds). 1977. Report of a colloquium on the multispecies fisheries problem, June 1976. Mar. Fish. Rev. 39(9):8-13.

This report does not constitute publication and is for information only.

Reporting the results of a colloquium held at the Tiburon Laboratory during June 1976, this paper defines the multispecies problem in fisheries management, illustrates its significance to management, and suggests research that would contribute toward solutions.

Approved by the Center Director

Dotson, Ronald C. "Fat deposition and utilization in albacore. For publication in the Proceedings of the Physiology Workshop.

Mendelssohn, Roy. Pareto optimal policies for harvesting with multiple objectives. For publication in the Journal of Economic Theory.

HONOLULU LABORATORY

RESOURCE ASSESSMENT AND DEVELOPMENT INVESTIGATIONS (RADI)

Honolulu Laboratory Hosts Seminar-Workshop on the Northwestern Hawaiian Islands Cooperative Study

Dr. Robert Skillman, coordinator, Cooperative Study of the Northwestern Hawaiian Islands (NWHI), convened a seminar-workshop at the East-West Center, University of Hawaii (UH), Manoa campus, to present an overview of ongoing and proposed research projects in the NWHI. One of the aims of the meeting was to integrate new research proposals from Sea Grant into the program and to see that ongoing research is kept on its charted course. Invited speakers made presentations on ongoing research and related activities, as listed below:

"Insular resources" - Mr. Richard Uchida, SWFC
"Pelagic resources" - Dr. Robert Skillman, SWFC
"Reef community studies" - Dr. Ted Hobson, SWFC
"Nearshore fisheries resources" - Mr. Henry Sakuda, Hawaii Division of Fish and Game
"Seabird and monk seal surveys" - Mr. Brent Giezentanner, U.S. Fish and Wildlife Service
"Proposed contracts" - Mr. Wilvan Van Campen, Western Pacific Regional Fishery Management Council
"Laysan Islands monk seal study" - Brian and Pattie Johnson, Marine Mammal Division, Northwest and Alaska Fisheries Center
"Proposed research projects" - Dr. Richard Grigg, University of Hawaii

Some of the participants in the seminar-workshop on the Northwestern Hawaiian Islands Cooperative Study held at the East-West Center, University of Hawaii, November 22, 1977.

Shown left to right are:

Brent Giezentanner, U.S. Fish and Wildlife Service; Brian Johnson, Contractor, Marine Mammal Division, Northwest and Alaska Fisheries Center; Henry Sakuda, Hawaii Division of Fish and Game; Robert Delong, Marine Mammal Division; Robert A. Skillman, Honolulu Laboratory, Southwest Fisheries Center; Ted S. Hobson, Tiburon Laboratory, Southwest Fisheries Center; Richard N. Uchida, Honolulu Laboratory, Southwest Fisheries Center, and Richard W. Grigg, Sea Grant Program, University of Hawaii.

Townsend Cromwell Returns from Northwestern Hawaiian Islands Cruise

The NOAA research vessel, Townsend Cromwell, returned to Honolulu on November 7 after completing Part I of Cruise 77-03-76, the fourth in a series of survey and assessment cruises to the NWHI. Mr. Richard Uchida, Chief Scientist, reported that relatively high densities of spiny lobster, Panulirus marginatus, were found along the southern edge of the bank at Necker Island, and also at Maro Reef, Laysan Island, and Raita Bank. Catch rates as high as 6.9 lobsters per trap-night were found at Necker Island and only 31% of the lobsters caught there were "shorts" (under the legal limit of 1 pound). In a continuing effort to elucidate the migration and growth of lobsters in the area, 1,216 spiny lobsters and 190 slipper lobsters, Scyllarides squammosus and Paribaccus antarcticus, were tagged and released at the site of capture. Fish trapping at Middle Bank, Nihoa, and Penguin Bank, produced an abundance of "taape" or blue-line snapper, Lutjanus kasmira, which was introduced into Hawaiian waters from Tahiti in 1955 by the Hawaii Division of Fish and Game. Handline fishing was excellent along the 70-120 fathom contours around some of the islands and banks. Red and pink snappers, Etelis marshi and Pristipomoides microlepis, were abundant around Nihoa and Necker Islands. Other commercially important fishes such as thicklip ulua, Caranx cheilio, sea bass, Epinephelus quernus, and pink snapper, P. microlepis, were abundant around Maro Reef and French Frigate Shoals. Troll catches included 136 kawakawa, Euthynnus affinis, 26 yellowfin tuna, Thunnus albacares, 12 wahoo, Acanthocybium solandri, 5 mahimahi, Coryphaena hippurus, and 10 carangids, Caranx ignobilis. Among troll-caught fishes, 93 kawakawa, 8 yellowfin tuna, and 1 wahoo were tagged and released. Trawling for bottom fish was generally unproductive. Catches varied from less than 1 kg to 24 kg; the largest catch consisted of slipper lobsters, S. squammosus, taken at Raita Bank in 91 m of water.

Other members of the scientific field party included Fishery Biologist James H. Uchiyama, Research Assistants Glenn R. Higashi, Darryl T. Tagami, and Robert L. Humphreys (October 18-November 7), and Cooperating Scientists William S. Lovejoy (September 5-October 11) and Michael T. Palmgren (October 18-November 7).

* * * * * * * * * *

Members of the Insular Resources Task at the Honolulu Laboratory continued activities related to the NWHI field work. Messers Uchiyama, Humphreys, Higashi, and Tagami worked on repairing fishing gear, processing data, and sorting biological material collected on Townsend Cromwell Cruise 77-03-76. Research Assistant Martina Queenth served as observer on the Easy Rider which fished for spiny lobsters in the NWHI

during the month. Fishery Biologist Thomas Hida began preparation for Townsend Cromwell Cruise 78-01, and Research Assistants Jose Enitan and Jeff Sampaga continued processing and reading Atlantic skipjack tuna otoliths for ICCAT.

Estimated 1977 Hawaii Landings of Skipjack Tuna Continue Below Long-Term Average

The October 24 to November 27 Hawaii landings of skipjack tuna were estimated at 130 metric tons (MT), which is 199 MT below the landings for the same period in 1976 and 94 MT below the 1948-76 long-term average for the same period. The cumulative landings from January through November 27 were estimated at 3,311 MT, which is 744 MT below last year's landings for the same period and 889 MT below the 1948-76 long-term average for the same period.

* * * * * * * * * *

Pulou Niuatoa, employee of the Government of American Samoa, measured 950 albacore from 19 vessels from September 30 to October 31. He also collected 23 sets of catch and effort data. Based on data from 5 vessels, the average size of albacore for the period was 90.1 cm and the average catch rate was 2.0 albacore per 100 hooks.

LA JOLLA LABORATORY

Coastal Fisheries Resources Division

COMMERCIAL AND RECREATIONAL FISHERIES FOR MANAGEMENT PROGRAM

Public Hearings on Anchovy Fishery Management Plan to Begin in January 1978

Final changes to the second draft of the Anchovy Fishery Management Plan were sent to the Pacific Fisheries Management Council on November 2. At the Council meeting on October 14-15, the Council approved the Plan for submission to public hearings, as required by the National Environmental Policy Act. The public hearings will be held in Long Beach on January 14 and in Monterey on January 21.

Related to the Anchovy Plan, California Fish and Game biologist Alec MacCall's Markov model is a current effort to investigate the consequences of estimating spawning biomass and setting quotas bi-annually rather than annually. The Markov model is being modified so that it will

calculate transition probabilities for a two- or three-year fishery. The resulting transition matrix has n^3 elements (where n is the number of discrete population sizes considered). The increase in computational time and cost dictates a coarser grid of population sizes. Computer implementation will be accomplished shortly. The results of the analysis will have an impact upon the decision to have annual or biannual stock assessments.

Preparation of Fishery Management Plans for Other Fish Species Started

Fishery Biologist Gary Stauffer has begun preparation of a Preliminary Fishery Management Plan for Pacific saury. Available foreign and U.S. literature on saury stocks were compiled and reviewed and a preliminary draft of the plan is now underway.

Economist Jane McMillan of the La Jolla Laboratory has begun the task of developing a Squid Management Plan. She has made a thorough library search for materials pertinent to squid or the economics of squid, contacted various state agencies and commercial enterprises knowledgeable about squid, prepared tables from data acquired in the search, and arranged for key punching of all pertinent production and economic data for later use in computerized statistical analysis.

* * * * * * * * * *

Mr. Keith Parker, Statistician at the La Jolla Laboratory, completed the editing of logs for five selected anchovy vessels (about 10,000 records). The data are now ready for creation of a data base. Analysis of these data will presumably shed light upon the utility of catch/effort data in the anchovy fishery.

Mr. Parker also completed a final draft of a paper entitled, "Density estimation by variable area transect." The paper is slated for submission to the Journal of Wildlife Management in early 1978. Mr. Parker also finished a report, entitled, "Best-mix sampling: an evaluation of technologies for absolute abundance estimation." This report is one stepping-stone to the solution of the much broader, practical problem of determining how and on what time schedule stock assessments should be performed for the management of northern anchovies. A new Task Development Plan for 1980 is being submitted on the subject of "best mix" for stock assessment.

* * * * * * * * * *

Economist Jane McMillan has collected information this month pertinent to the economic productivity of fisheries in California--data which were used in Dr. Huppert's presentation to the American Institute of Fishery Research Biologists colloquium on November 8 at the Southwest Fisheries Center.

Ms. McMillan is also gathering information on the sociological data and analysis needs of fishery management. A bibliography of pertinent papers is being compiled and various materials on the social or anthropological characteristics of fisheries collected.

LARVAL FISHES, COASTAL E. PACIFIC

Findings of Major Importance to Prediction of Lethal Dose Ultraviolet Levels Under any Given Conditions in the Sea is Indicated by Experimental Results

Dr. John Hunter, Fishery Biologist at the La Jolla Laboratory, reports that the staff working on effects of uv-B on eggs and larvae continued to analyze specimens and data from experiments conducted earlier in fiscal year 1977. The studies are funded by the Environmental Protection Agency through a contract awarded to the NMFS Southwest Fisheries Center. Their most recent findings are as follows:

Exposure to uv-B irradiation retards growth and development in larval anchovy and mackerel. Larvae exposed to uv-B had more yolk, were smaller in length and depth, and had less eye pigmentation than did the controls. The extent of retardation in all four characteristics was linearly related to cumulative dosage received at the close of the embryonic period.

Larval anchovy and mackerel respond to uv-B irradiation by expansion of their melanophores (black pigment cells); the extent of expansion is related to cumulative dosage.

The integrated uv-B energy received by a larval anchovy, when weighted by the Setlow general action spectrum for DNA, can be used to predict the lethal dose under any spectral energy distribution of uv-B. If substantiated by future experiments, this finding will be of major importance because it will permit extension of laboratory thresholds to any given condition in the sea.

* * * * * * * * * *

At the request of the Canadian government, Drs. R. Lasker, Leader of the Coastal Fisheries Resources Division, and R. Owen, Oceanographer at the La Jolla Laboratory, joined the Canadian research vessel Baffin in Chimbote, Peru, November 5. Earlier, Dr. Lasker spent the first week of November instructing Peruvian scientists at the Instituto del Mar del Peru (IMARPE) on the shipboard experiments that were eventually to be performed aboard the Baffin. The experiment aboard the Baffin was a study of feeding by Peruvian anchoveta (Engraulis ringens) which showed that these larvae, as for northern anchovy larvae, do not ingest diatoms,

particularly when these are in very high concentrations. Very unusually high phytoplankton biomasses were encountered in the form of Skeletonema and Chaetoceros blooms in the Peruvian coastal zone out to approximately 20 miles from shore. Plankton tows in the region had anchovy eggs in them, but no yolk-sac or first-feeding larvae were found. Neuston tows showed that there were older larvae, approximately 20-30 days old, in surface waters. The older larvae were preserved for dating by otolith ring counts and these showed that the dates of spawning for larvae which ranged in size from 10.5 to 16.5 mm was between October 6 and 18, with most being born on the 13th.

* * * * * * * * * *

During the third week of November, Dr. Lasker attended the conference on Spatial Pattern in Pelagic Communities held at Erice, Sicily. His paper entitled, "Growth and survival of first-feeding northern anchovy larvae (Engraulis mordax) in patches containing different proportions of large and small prey," will be published in the proceedings of the symposium. In it he showed the importance of aggregations of small (about 45 μm) particles to survival of first-feeding anchovy larvae.

On November 29 Dr. Lasker attended a post-IDOE planning meeting of the Ocean Sciences Board for the National Academy of Sciences and on November 30 attended the Advisory Committee meeting on Oceanography at the National Science Foundation in Washington, D.C.

Microscale Plankton Work Extended to Waters off Peru

The work of Dr. R. Owen, Oceanographer at the La Jolla Laboratory, on small-scale changes in concentration of small organisms and their significance to feeding by fish larvae was extended this month to the anchoveta spawning grounds in the shelf waters off Peru. With Dr. Lasker, he participated in a cruise of the Canadian research vessel, Baffin, which left Chimbote, Peru on November 5 for a 2-week survey. Seeking the presence of "microscale layers" of small plankton on which California anchovy larvae appear to depend for early survival, Dr. Owen deployed his microscale sampler in mixed layer and upper thermocline to measure particle concentration and size distribution, phytoplankton pigments, phytoplankton and microzooplankton organism concentration, nutrients, oxygen and salinity.

Coastal Peru Current microstructure, from preliminary results, is not as pronounced as that in its analog, the California Current: statistically significant variations occur for particle and pigment concentrations but the variations were notably smaller than those experienced under similar physical conditions off California. Absolute concentrations of biogenics appear to be higher off Peru, which may offset the larvae's need for the presence of microscale layers of higher food concentrations.

Reduction of microscale layers and increase of average food stocks may both be accounted for by increased vertical mixing off Peru.

Descriptions of Formation and Development of Organs Compiled for Larval Mackerel and Achovy to Estimate Incidence of Starvation

As a supplement to the histological survey of Pacific mackerel and anchovy larvae to estimate incidence of starvation in the sea (microscopic analysis in progress), descriptions of organogenesis of these species are being compiled by Dr. C. O'Connell, Fishery Biologist at the La Jolla Laboratory. Documentation of the extensive developmental changes that occur during early weeks, when mortality is also high, should facilitate evaluation of the condition over the wide size range of specimens in ocean samples. The following are a few examples of the kinds of changes Dr. O'Connell has described for the anchovy.

The eyes are undifferentiated at hatching but have a functioning cone system, including a fovea-like spot, and functional oculomotor muscles that can train the "high resolution" visual axis on points of interest by day 4, when there is still a yolk remnant. The rod system and hence dim light visual sensitivity, on the other hand, does not start to develop until the third week (10 to 12 mm). Trunk musculature of the anchovy goes through three stages of development: embryonic musculature, thin layers of fibers arranged on a bias round the notochord, prevails for the first week; accretionary growth, where new fibers of a different sort are added at free myotome surfaces in an alignment more or less parallel to the body axis, gradually builds the musculature laterally and dorsally above the spinal cord; and finally (about 25 mm/50 days), satellite growth, where new fibers are added only between existing mature fibers, producing no further alteration in myotome shape. The last of these stages may hold some possibility as a measureable index of growth or condition.

The digestive tract shows major changes over a long period. Early features are progressive opening of the mouth and branchial clefts, initial appearance of a zymogen reserve in the pancreas on day 4, functional status of the jaw angle (corner of the mouth) and its musculature on day 4, or day 3 in some specimens. Late developing features include appearance of the stomach and its glands, and differentiation and then elongation of the upper limbs of the branchial arches, which greatly alters the mechanics of mouth action.

These and may other changes have been tabulated or plotted in relation to each other to provide some sense of development stage in all systems in respect to age and/or length. It appears, incidentally, that development relates better to age than to length for about the first week after hatching, but beyond two weeks development is primarily associated with length.

Morphological Technique for Estimating Larval Survival in the Sea to be Tested

At the La Jolla Laboratory Fishery Biologist Gail Theilacker continued her studies of larval fish starvation. Laboratory rearing experiments with alternate periods of feeding and starving were completed for jack mackerel, Pacific mackerel, and barracuda, and are now in progress with anchovy larvae. Larvae were sampled daily and preserved for measuring. Measured larvae are now being embedded in paraffin, sectioned, and stained for subsequent histological examination.

Previously it was shown by Ms. Theilacker that a morphometric technique was a precise as a histological one in diagnosing the condition of laboratory-reared jack mackerel larvae. The morphological approach for estimating survival in the field is preferred because it is simpler and quicker than using histology. Ms. Theilacker plans to test the morphometric technique by examining each field-caught larva histologically and then comparing the results. Larvae collected during routine CalCOFI cruises cannot be used for histological studies but could be used for morphometric studies if the technique is proven. To assess, with histological techniques, the condition of a larva, it must be preserved quickly. If the time lapse between death and preservation is more than 10 minutes, autolysis (enzymatic digestion of the larval tissues) takes place. Autolyzed tissue resembles tissue disintegration caused by starvation; late preservation, therefore, could cause an error when estimating larval condition. CalCOFI tows are longer than 10 minutes.

Ms. Theilacker participated in two special, 2-day cruises in October aboard the NOAA research vessel Jordan, to search for jack mackerel larvae. Jack mackerel eggs and two larvae were located at the 41-fathom bank, about 50 miles off San Diego. The Jordan stayed in this area and 45 plankton hauls were made. All the samples were quickly preserved in Bouin's fixative. The samples have not yet been sorted; however, morphometric measurements indicate that the two larvae which were netted in the same location were probably starving.

Otolith Study to Determine Age and Growth Began on Atlantic Skipjack Tuna

Personnel in the Coastal Fisheries Resources Division at the La Jolla Laboratory, in cooperation with the Division of Oceanic Fisheries Resources at the laboratory, have begun a study of daily increments of the otoliths of Atlantic skipjack tuna. This work has been transferred to the La Jolla Laboratory from the Honolulu Laboratory and will be supervised by Fishery Biologist David Kramer who will be assisted by Ms. Elsie Cubero of the University of California, San Diego.

Work also continues on studies of daily increments of juvenile as well as larval anchovy otoliths. Mr. Kramer is assisted in these additional studies by Ms. Tracy Shafer, University of California, San Diego.

Interaction Between Longline and Surface for Yellowfin Tuna Examined in Manuscript

Mr. James Zweifel, Mathematician at the La Jolla Laboratory, together with William Lenarz, Fishery Biologist of the Center's Tiburon Laboratory, have completed a revision of their manuscript on the interaction between longline and surface fisheries for yellowfin tuna. This paper examines the effects of differential availability to the two gears, and the interrelations of pattern of movement of fish pattern of recruitment and fishing strategy. In addition, effects on yield of departure from the theoretical 1:1 sex ratio is explored.

* * * * * * * * * *

Mr. Zweifel has also completed a revision of his manuscript entitled "A Non-Linear Model for Allometry in Larval Fish" to be submitted for approval for publication. This paper describes an equation for fitting length-weight and body part relationships in the early life stages of fish where marked changes in morphology render the equation of simple allometry $y=ax^b$ inadequate. Significance tests for linearity and procedures for the comparison of two or more non-linear allometric relationships are included.

* * * * * * * * * *

With John Hunter and Carol Sanchez, James Zweifel is writing a manuscript on "The Effect of Temperature and Diet on the Embryonic Development and Post-hatch Growth of Laboratory-Reared Fish Larvae." This work will analyze growth under varying conditions using the Gompertz growth model proposed in Zweifel and Lasker (1976). The laboratory and analytical problems inherent in growth experiments will be discussed and estimation procedures will be outlined. To date, two sections have been completed. One on effects of temperature on embryonic development of fishes, shows that the relationships of temperature, developmental stage, and age may be modelled with an equation containing four easily estimable parameters. The other, the potential effects of differential mortality and selection, shows: 1) that any selected part of the sampled larvae (e.g., largest or smallest) has a SP growth curve of the same form, and 2) that the parameters of these curves may be estimated by knowing only the average growth parameters and the variance at the beginning of the growth cycle. Thus the growth curves for any percentile of the distribution (e.g., best 10%, worst 10%, etc.) may easily be calculated and contrasted with other experimental data or field caught specimens.

SURVEY SYSTEMS DEVELOPMENT AND EVALUATION PROGRAM

Dr. Paul Smith, Leader of the Survey Systems Development and Evaluation program at the La Jolla Laboratory, traveled to the Instituto Nacional de Pesca (INP) Laboratory at Ensenada, Baja California, Mexico for discussions with Waltario Garcia, on the 1977 year class in the Ensenada fishery for the resonance frequency project and to set a date for completion of the Acoustic Subcommittee Report to the CalCOFI/INP Assessment Subcommittee. Dr. Smith and Mr. Garcia are the Coordinators for the Acoustic Subcommittee.

From September 20 to October 2, 1977, the Mexican research vessel Alzate conducted an acoustics cruise over the area of the southern subpopulation of northern anchovy. They estimated that 108,000 metric tons of anchovy were in the near-shore regions along the coast south of Punta Eugenia. Trawl hauls were made to confirm the sonar observations. Eight of ten trawls contained anchoveta, 55 mm to 116 mm in length. One haul without anchoveta was completely empty and the other was full of red crab and squid. Among other fishes taken in the trawls were barracuda, Pacific mackerel, pompano, jack mackerel and smelt.

The 1977 anchovy year class appears to be prominent in the catch at Ensenada and is also quite high in the catch at San Pedro.

Dr. Smith plans to meet with the Acoustic Subcommittee in Ensenada on January 24 with one day of meetings to present the results of the 1977 cruises and research and analysis, and one-half day allotted for preparing the report to the CalCOFI/INP Subcommittee. This report will be sumitted in draft to the subcommittee members and presented finally to the Assessment Subcommittee in February for their deliberations in Mexico City in March 1978.

U.S.-Mexico Plan Cooperative Fisheries Research in the California Current

Following the annual California Cooperative Oceanic Fisheries Investigations conference in La Jolla, members of the CalCOFI-Instituto Nacional de Pesca Stock Assessment Committee met at the Center November 4 to review and plan cooperative arrangements for fisheries research in the California Current. Members of the Committee include Director I. Barrett, Drs. R. Lasker and P. Smith of the La Jolla Laboratory, Dr. J. Carranza of INP, Messrs. J. Radovich and H. Frey of California Department of Fish and R. Keir of FAO UNDP project in Mexico City.

At the meeting, Dr. Dan Huppert provided an informal review of the second draft of the northern anchovy plan being developed by the Pacific Fishery Management Council. Dr. Huppert told the group that for the purposes of the U.S.-Mexico cooperative program, the key feature of the

Anchovy Plan is the requirement for an annual quota which is set by mathematically defined policy given an estimate for spawning biomass. The only method for implementation for this purpose presently is the larval census method. This requires a small number of 20-day cruises during January to May over the range of the central subpopulation spawning area. Dr. Smith suggested that the acoustic method for estimation of anchovy biomass could reasonably be developed in the context of the larval census cruises. This would require little extra ship time and would have the larval census methods for calibration of the acoustic survey results. When the agreement between the larva census method and the acoustic method becomes satisfactory, the acoustic method could be done with about 1/4 of the ship time presently required.

In other action, the group reviewed the work of the CalCOFI/INP Stock Assessment, noting that the subcommittee had not met as a group during the last year; however, some work has been done on preparing the logs from a select anchovy fleet for analysis.

The Egg and Larvae Subcommittee had not met as a group during the last year; however, some training and exchange of personnel on cruises has been continuing.

The Acoustic Surveys Subcommittee has met during the last year and several cooperative cruises have been conducted. A review of the meeting of this subcommittee is presented in a following section.

Members of the Aging and Sampling Subcommittee have been meeting on a bimonthly basis to exchange data on the anchovy fishery and to collaborate on fish-aging techniques.

The Data Management Systems Subcommittee has not met. Work is, however, progressing in preparing CalCOFI data for a data system at NMFS.

The Modeling Subcommittee has not met since last year. There has, however, been considerable correspondence between members of the committee. Since much of the subject material requires time for consideration, the use of correspondence seems to be the most appropriate method for exchange of ideas, etc. by members of this subcommittee.

Dr. Jorge Carranza, Director of INP, suggested that the various subcommittees prepare a report on their progress for the CalCOFI/INP Stock Assessment Committee every six months. Dr. Carranza also suggested that rather than have a chairman for each of the subcommittees that two coordinators, one from Mexico and one from California, be appointed for each subcommittee; subsequently, two coordinators were designated for each subcommittee.

* * * * * * * * * *

The Acoustic Survey Subcommittee of the CalCOFI/INP Stock Assessment Committee (Technical) met at the La Jolla Laboratory to discuss the status of acoustic surveys and future plans. At this meeting, Dr. Paul Smith of the La Jolla Laboratory was designated as the Coordinator for the Subcommittee.

Jack Brown, Electronics Technician at the La Jolla Laboratory, reported that MRC money is budgeted this year for acquiring two sets of sonar mapping microprocessors to provide data on the size and abundance of fish schools. An extended discussion on the new technique appeared to resolve the question about improvement of the echo level estimate from the peak echo level provided by the old PDP-8 system to an X, Y integrated echo level with the microprocessor units. The answer to this question awaits final programming of the units and checks on the results.

Dr. Van Holliday of Tracor, Inc. which has a contract with the NMFS, reported on his work aboard the NOAA research vessel Jordan. The resonance frequency technique is for identifying bladder-bearing schooling organisms and estimation of bladder size. These data are intended for use in directing trawl samples for recruitment prediction and mapping of the areas where juveniles and adults can be distinguished so that schooled biomass and spawning biomass can be estimated separately.

Dr. Smith said that the early proposal stage for implementing doppler spread analysis for positive remote identification of schooling fish is in the 1980 budget. Doppler spread uses the motions of the fish, fish body parts and school dynamics from different aspects to identify the fish to species. This technique also contains the possibility of distinguishing different behavior, such as feeding, breeding or migrating, so that models of energy consumption could be derived for the energetic section of ecological models.

Mr. Alfredo Cota of INP, Mexico reported that his country has conducted two acoustic surveys off Baja California this year, and reports of the cruises are in preparation.

Dr. Smith reported that a survey of the spawning area of the northern subpopulation of the anchovy was conducted off Oregon this year. Most of the other activity was concerned with local work in support of the resonance frequency implementation.

Dr. Holliday commented that the last cruise for resonance frequency produced the most satisfactory results in that the fish school groups within the region were located first at high speed and the detailed work of resonance frequency maps and trawl hauls was done by return to those areas. Dr. Holliday also commented that an area to which the Jordan

had been directed by Mr. K. Mais of the California Fish and Game for small fish also had a characteristic distribution of schools in weak clouds which have been labeled "chowder." Confirming trawls in that area were made up of exclusively young-of-the-year fish.

Mr. Squire of the La Jolla Laboratory reported on aerial surveys and the time series of data since 1963 using the contract aerial fish spotter pilots for logging incidental sightings of fish by species and estimated weight.

MULTISPECIES TAXONOMY PROGRAM

Dr. E. Ahstrom, Leader of the Multispecies Taxonomy program at the La Jolla Laboratory, reports that emphasis continues to be placed on reducing the backlog of egg and larva samples collected on CalCOFI cruises. Only portions of two CalCOFI cruises made in 1975 remain to be identified.

Biological Technician Elaine Sandknop is now identifying species of rockfishes from past CalCOFI collections to obtain more information on abundance of their larvae over time. To help maintain the pace of identification of CalCOFI collections, Ms. Connie Frey is now helping to identify specimens from the regular CalCOFI collections of eggs and larvae.

* * * * * * * * * *

Center Staff Participates in CalCOFI Conference

Sponsored this year by the Scripps Institution of Oceanography, the annual CalCOFI Conference was held in La Jolla, November 1-3, 1977. The staff of the Coastal Fisheries Resources Division and other individuals closely associated with the research program were well represented among the talks presented, as follows:

Dr. Gary Stauffer discussed, "Results of egg and larva surveys for Pacific hake in recent years."

Dr. Nancy Moffatt: The evolution of beach spawning in grunions (*Leuresthes*): An hypothesis.

Mr. Keith Parker: Best mix sampling for anchovy biomass.

Mr. R. Methot, Jr. and Mr. David Kramer: Spatial variations in the *in situ* growth rate of anchovy larvae.

Dr. Paul Smith and Mr. Roger Hewitt: Recent advances in sonar mapping and associated techniques.

Dr. Smith: What is a valid CalCOFI tow and how do you know if you are doing one?

Mr. David Mackett: CalCOFI data management system.

Drs. G. Moser and E. Ahlstrom: Larvae and pelagic juveniles of the blackgill rockfish, Sebastes melanostomus, taken in midwater trawls of southern California and Baja California.

Mr. John Butler: Midwater fishes collected by CalCOFI cruises in 1972.

Mr. Alex MacCall of CF&G at the La Jolla Laboratory: Use of a Markov probability model for investigating alternative anchovy harvesting options.

Ms. V. Loeb: Seasonal aspects of the larval fish species structure in the North Pacific central gyre.

Dr. David Arthur: Differences in heart size between ocean-caught and laboratory-grown larvae of the northern anchovy. Implications for larval behavior and survival.

The host agency for the 1978 CalCOFI Conference will be the National Marine Fisheries Service.

Oceanic Fisheries Resources Division

PORPOISE/TUNA INTERACTION PROGRAM

Tuna Seiner Committed to Porpoise/Tuna Research for One Year

The U.S. Tuna Foundation, an organization composed of boat owners and managers, canners, and unions, has chartered the purse seiner, Queen Mary, for one year, at a cost of $1.6 million, for research on the porpoise/tuna problem. The three major parties to the "dedicated vessel" agreement are the U.S. Tuna Foundation (USTF), NMFS; and the Marine Mammal Commission (MMC). Some of the work to be carried out during the year will be sponsored by the National Science Foundation. There will be five research cruises, each about 50 days long, with the first planned to begin on January 15, 1978. The seiner will accomodate a scientific party of six. Overall logistics and planning coordination will be handled by a Program Manager to be hired by the Marine Mammal Commission.

The Manager will report to a Program Board, composed of one representative each from NMFS, USTF and MMC, which will accept or reject proposals for research on the vessel. The Program Board in turn will report to an Executive Board, composed of representatives at the policy level in the three organizations party to the agreement.

Research planned by the Southwest Fisheries Center for the first cruise includes development of techniques to release porpoise before the "backdown" phase of the net set ("backing down" is an efficient rescue technique but itself results in some mortality, especially when very large numbers of porpoise are involved), observations of behavior of tuna and porpoise in the net, and studies of the physiological effects of chase and capture. NMFS personnel will include J.M. Coe, Fishery Biologist; D. Holts, Fishing Methods and Equipment Specialist; and another Fishing Methods and Equipment Specialist yet to be hired. F. Awbrey of San Diego State University will also conduct research on the cruise on bioacoustics under a grant from the Research Applied to National Needs (RANN) program of National Science Foundation.

The second cruise, slated for March-May, will be dedicated largely to "whole school studies." The purposes of capturing and examining (and/or tagging) whole schools will be two: 1) to determine whether or not the samples of dead porpoise now used to estimate reproductive parameters are representative of the population at large with respect to age and sex structures, and 2) to examine the cohesion of schools through time. A double-tagging experiment will also be carried out, to generate an estimate of shredding rate to be used in design of future, large-scale tagging experiments to estimate population size. Plans for cruises 3-5 of the dedicated tuna vessel are still in the formative stage.

Plan for Porpoise Observer Allocation During 1978 Developed

A plan for observer allocation during 1978 was developed by Dr. Nancy Lo, Biological Statistician in the Marine Mammal Assessment and Monitoring program in consultation with the NMFS Southwest Regional office in Terminal Island. The plan gives the temporal, gear and vessel class pattern of placement of observers which will minimize the variance and bias of the incidental mortality estimates, given the practicalities of placement. The analyses were based upon variances and seasonal variations in observer data of previous years.

* * * * * * * * * *

The NOAA research vessel David Starr Jordan returned on November 21 from a 2-month cruise to the eastern tropical Pacific. The primary mission was to determine the effects of the summer-fall intensification of the Peru Current and the North Equatorial Countercurrent upon the distribution of dolphin species. Preliminary results, according to the cruise leader Dr. David Au indicate some shifts in dolphin distribution with the retreat of tropical water from this region.

TUNA RESOURCES PROGRAM

Biological Sampling of Foreign Imports of Atlantic Tunas Continues in Puerto Rico

Atlantic-caught tunas transshipped to Puerto Rico have been routinely sampled for biological information by Biological Technician Eugene Holzapfel of the La Jolla Laboratory since March 1975. Data on fork length, weight and species composition were collected. The data were processed by Computer Programmer Janet Sticht at the La Jolla Laboratory. The results of sampling during the period January to November 1977 are as follows:

Species	Gear	No. of Samples	No. of Fish Sampled	Tonnage Sampled (MT)
Yellowfin	Baitboat	29	1169	173
	Purse seine	2	81	27
	Unknown	2	86	6
Skipjack	Baitboat	24	1214	3299
	Purse seine	9	454	2434
	Unknown	1	50	98
Bigeye	Baitboat	17	791	116
	Purse seine	2	88	54
	Unknown	1	44	4
Albacore	Longline	4	200	655
Total		91	4177	6866

* * * * * * * * * * *

The October issue of "Fishing Information," a monthly publication issued by the Southwest Fisheries Center went to press on November 28. Two supplements (15-day charts) were also issued during the month.

* * * * * * * * * * *

A working paper entitled, "A brief review of billfish life history and population dynamics parameters" was prepared by Dr. Norman Bartoo, Fishery Biologist. The paper will be presented and discussed at the Billfish Technical Workshop to be held in Honolulu in December 1977.

In this paper, Dr. Bartoo reviews available literature on billfish for parameters and estimates necessary for population dynamics research. Some additional analysis of literature data is presented.

Tuna Vessels Participate in Fisheries Service' Fax Program

During November 17, U.S. tropical tuna vessels participated in the FAX program of the La Jolla Laboratory.

	Weather Observations	XBT Observations	Total	Total Year to Date
1976	123	2	125	2578
1977	235	22	257	2045
Percent change	91%	1000%	105.6%	-20.7%

The tuna seiner, Santa Rosa, again led all cooperating vessels in November with 49 weather observations sent to the Southwest Fisheries Center via radio station WWD. The Santa Rosa's reports comprised 20.8% of the total number sent in. Congratulations are due to Captains Noah and John Gomes of the Santa Rosa.

* * * * * * * * * *

Contract Awarded for Ecosystems Analysis of Eastern Tropical Pacific

A group led by Dr. George S. Innis of Utah State University met with members of the staff at the La Jolla Laboratory and with Inter-American Tropical Tuna Commission staff on November 21-22 to initiate discussions of an ecosystems analysis of the eastern tropical Pacific to be performed by Dr. Innis in contractual arrangements with the Center's Marine Mammal Assessment and Monitoring program. The objectives of the study as delimited by the discussions are to create a hierarchy of models with each level of the hierarchy being more explicit in the representation of ecological relationships and, therefore, more data-hungry. Model results will be used to ascertain those relationships whose understanding is critical to porpoise/tuna populations dynamics and management. Their appropriate hypotheses may be formulated and research planned to address the hypotheses.

PACIFIC ENVIRONMENTAL GROUP

OCEAN CLIMATOLOGY AND MONITORING

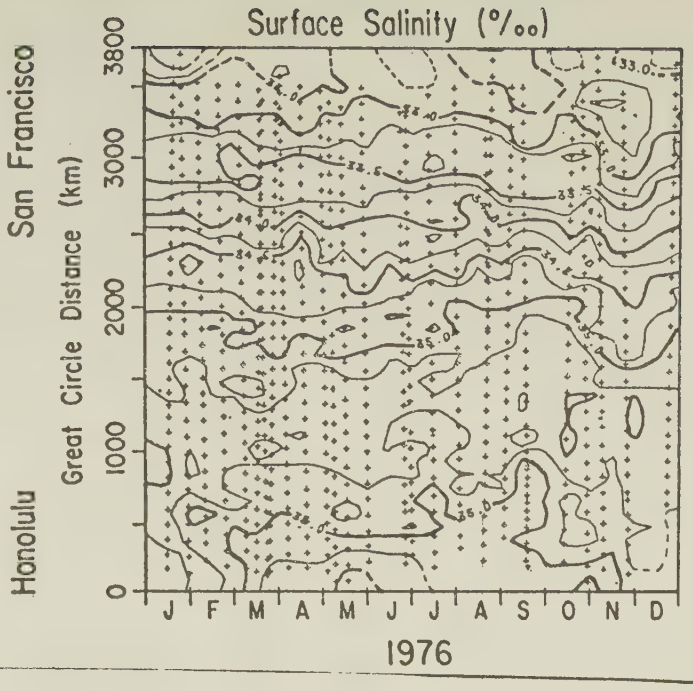
Anomalous Salinity Distribution May Indicate Changes in Oceanographic Circulation Affecting Fish Distribution

The winter of 1976-77 is now well known for its unusal atmospheric circulation which resulted in a drought in the western U.S. and record-breaking cold in the eastern U.S. Anomalously high upwelling associated with the unusual circulation pattern during 1977 was described in the last monthly report. The anomalous atmospheric circulation during the winter 1976-77 was also reflected in anomalous ocean surface conditions as monitored from merchant vessels regularly making XBT and surface observations between San Francisco and Honlulu. This program is operating by the PEG under staff Director G. Seckel, and is sponsored by the National Science Foundation under the NORPAX program. The figure shows the distribution of surface salinity observed during 1976 from San Francisco to Honolulu. Low salinities are observed in the California Current while a band of high salinities is observed near Hawaii. Surface salinity increases rapidly with distance towards Hawaii between the California Current and the more saline, North Pacific Central Water.

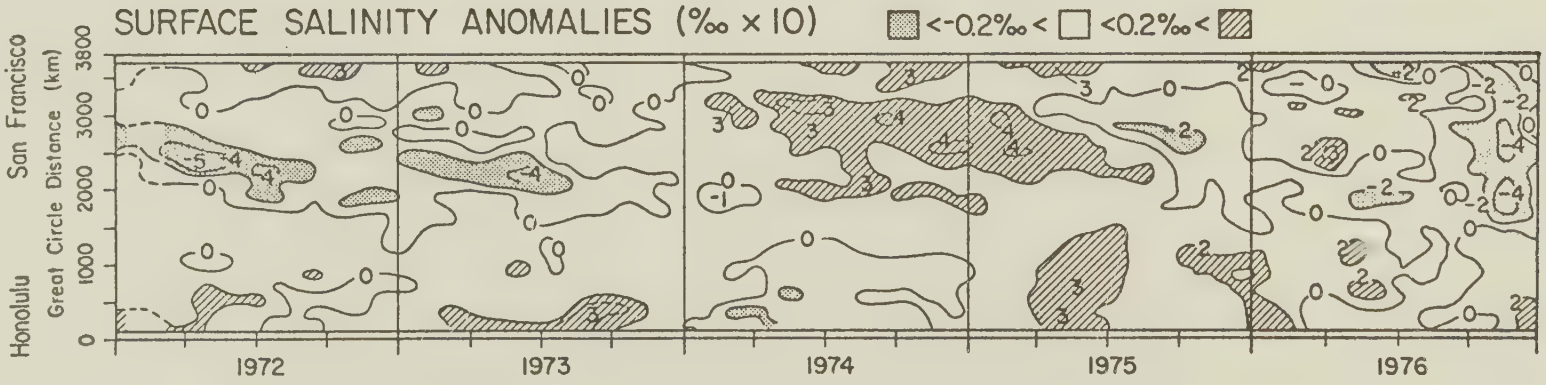
The changes of the surface salinity from its long term mean pattern are also shown in the figure for the years 1972-1976. During 1972-1975 large, slowly moving pools of anomalous low or high salinity were observed. These pools apparently migrated slowly towards Hawaii and persisted about 2 years. Positive anomalies of surface salinity were associated with positive anomalies of surface temperature while negative salinity were less closely associated with negative temperature anomalies.

During late 1976 the pattern of surface salinity was markedly different as was the relation with surface temperature. During November 1976 a pool of anomalously low salinity water suddenly appeared in the California Current that was associated with an appearance of warmer than normal surface temperatures--a breakdown of the previous relation. The anomalous salinity pools occurring during 1972-75 apparently were caused by varying transport of cool, low salinity water into the area from the north by the California Current. The unusual pattern during late 1976 could have been caused by a combination of advection of low salinity water into the area and strong local heating under the persistent, high pressure ridge which occurred over the west coast at that time.

Although these anomalous salinity distributions are not believed to affect fish distributions directly, they do indicate changes in oceanographic circulation and other processes that, in turn, may affect fish populations. For example in spring 1977, after the unusual winter of 1976-77, the annual offshore survey of the David Starr Jordan found



Distribution of observations of surface salinity made during 1976 by merchant ships between San Francisco and Hawaii. Each cross represents a separate observation.



Distribution of anomaly of surface salinity from its long term mean. Note pools of anomalous salinity water during 1972-75 which persist about two years and apparently move towards Hawaii. Note also sudden appearance of low salinity pool late in 1976.

only weak or diffuse fronts. In previous years the Jordan had observed strong temperature fronts which were associated with concentrations of albacore. Thus an understanding of how atmospheric forcing and other processes affect the distribution of surface temperature and salinity will probably also shed light on the mechanisms that affect the distribution of albacore.

TIBURON LABORATORY

SH COMMUNITIES INVESTIGATION

Workshop on Determining Age of Rockfishes Held at the Tiburon Laboratory

A major need in assessing population dynamics is accurate and reliable techniques to determine age. To advance the art of aging rockfishes, a workshop attended by members of the Rockfish Analysis Task of the Tiburon Laboratory and the biologists of the California Department of Fish and Game, was held November 29 at the Tiburon Laboratory. The participants agreed in their readings of the more prominent growth rings on otoliths of easy-to-read species like Sebastes flavidus, but controversy existed on interpreting certain features, notably the outermost ring. It was agreed, however, that systematic examination of a series of otoliths probably would resolve the differences in opinion. Eric Knaggs, CF&G biologist from Long Beach, reported that his group had confirmed that otolith rings are annuli to ages of 5 or 6 years in some important rockfish species, but apparently not in others. The group plans to meet monthly until these important aging problems are solved.

Investigation Leader Participates in Northwest Hawaiian Island Studies Workshop

During this month, Dr. Edmund Hobson, Leader of the Fish Communities Investigation, participated in a workshop on studies in the Northwest Hawaiian Islands, organized jointly by NMFS and the University of Hawaii. The Sea Grant program at the University is considering extensive projects that would complement work currently under way in the Northwest Hawaiian Islands by NMFS, the U.S. Fish and Wildlife Service, and the State of Hawaii Department of Natural Resources. Dr. Hobson was asked to express his views based on the work he and Tony Chess, of Tiburon's Nearshore Fish Communities Task, did at Kure and Midway atolls last summer.

Industrial Economist Contributes to Groundfish Management Plan of the Pacific Fisheries Management Council

In his work for the Pacific Fisheries Management Council (PFMC), Mr. Edward Ueber, Industrial Economist with the Rockfish Analysis Task at the Tiburon Laboratory, this month completed drafts of two proposal requests for the Goundfish Management Plan Development Team, as well as a draft on the economics of the dungeness crab fishery. He also discussed these topics with the Scientific and Statistical Committee of the PFMC at its November meeting in Los Angeles.

Proposal Made to Expand Rockfish Analysis Task in FY 1980

Drs. Hobson and Lenarz, along with Mr. Ueber, prepared Task Development Plans for 1980. It was proposed to expand the Rockfish Analysis Task to incorporate more work on life histories and to include studies of other groundfishes. This expansion is designed to meet more adequately the needs of the Northern California commercial and recreational fisheries. To meet this same need, it was also proposed that additional studies be directed at the economics of fisheries based in the Eureka area. In addition, a new Task was proposed that would investigate predator-prey relationships of rockfishes, striped bass, salmon, and other important species living at depths greater than 40 m.

FISHERIES DEVELOPMENT INVESTIGATION

Experimental Midwater Trawling Gear Installed Aboard Fishing Vessel

Experimental midwater trawling gear has been installed aboard the fishing vessel, Cape Wendy, at Bodega Bay by researchers from the Tiburon Laboratory. Fishing trials for yellowtail rockfish could not be conducted, however, due to rough seas and travel commitments. Initial trials will be held next month.

A midwater trawl has been purchased for capturing euphausids. Up to four firms are interested in purchasing euphausids, but the amounts will depend on the price for the processed product. Commercial fishing for this species will start in December or January.

An initial order for 50 tons of shortbelly rockfish has been placed by a firm interested in exporting whole frozen fish to Japan. Mr. Kato indicated he will consult with the industry in the Monterey area to locate a boat owner willing to try experimental fishing with NMFS gear. If funds are available, the Tiburon Laboratory will purchase a suitable midwater trawl by the end of January.

Recreational Fisheries Improvement Task

Fishery biologist Roger Green at the Tiburon Laboratory reported that tagging and release were completed for the last batch of coho salmon reared. Of the 28,256 fish received in September, 6,694 were both tagged and freeze-branded, and 3,168 of the smaller fish were freeze-branded only. Aside from high initial mortality, this group of fish was exceptionally healthy and fast growing during pen rearing. The stock came originally from the Toutle River in Washington.

Nine more tag returns were received from the Laboratory's king salmon release of December 1976. Tag return rate, corrected for mortality, now stands at 4.6% for this release. Five of those fish were returned from the Sacramento River, indicating that perhaps this release did not imprint on the Tiburon site. It may be necessary to obtain king salmon at an earlier stage in order to manipulate imprinting.

Five coho salmon, all untagged, were caught in the gill net this month. Two of these were large fish--10.8 and 12.0 lbs.--probably returned from the Laboratory's 1975 fall or 1976 spring releases.

Plans Made to Phase Out Salmon Rearing at Tiburon Laboratory After 1978

A meeting was held at the Tiburon laboratory November 8 on the salmon project with members of cooperating agencies: Tyee Club, California Department of Fish and Game and the University of California. A summary of results to date was presented and future plans discussed. Pending availability of fish, king salmon will be tried again next spring and imprinting experiments conducted on silver salmon later in 1978. Following these activities the project will begin phasing out, with returns monitored in succeeding years. A final report will be made.

PHYSIOLOGY INVESTIGATION

Experiments Indicate Striped Bass Thrive Best on Young Neomysis Shrimp

A 10-week experiment to examine at the Tiburon Laboratory the effects of different food rations of live adult Artemia salina and Neomysis sp. on growth and survival of striped bass (Morone saxatilis) juveniles ended this month. Results indicated that Artemia, considered a standard food by home aquarists and aquaculturists, was inferior to the natural food of juvenile striped bass, the Neomysis shrimp. Young-of-the-year striped bass survived and grew significantly better on Neomysis when fed equivalent rations of 1, 5 and 10% of their wet body weight per day. The 5 and 10% Neomysis rations produced the best growth, attaining an average standard length of 5.7 cm and wet weight of 2.58 g. Results from the

three (1, 5 and 10%) Artemia and the remaining 10% Neomysis rations were similar. Percent body water contents were inversely related to the food rations. Bass fed the high Neomysis ration had 77.0% while the low Artemia concentration had 82.7%; further indication of the higher nutritional value of Neomysis.

Work continued on manuscripts and laboratory analyses of data generated from two years of experiments testing factors affecting mortality in striped bass eggs and larvae.

Effects of Crude Oil on Flounder and Clam Tissues Examined

Dr. J. Whipple reported that processing of tissue samples continued throughout the month at the Tiburon Laboratory with additional testing conducted using the photoionization detector for analyzing low-boiling-point petroleum hydrocarbons in flounder and clam tissues.

Livers from flounder exposed to water-soluble components (WSF) of crude oil in food, water or food and water for five weeks attained average concentrations of low-boiling-point hydrocarbons of 1.72, 180.08, and 241.23 ppm respectively. Concentrations of the same components in food items were about 8 ppm while those in water were only 100 ppb.

Monocyclic aromatic compounds accumulated rapidly from the water column. In an extreme case, after only one week of exposure to 100 ppb WSF in water, levels of monocyclics were 900 (benzene) to 97,000 (p-xylene) times higher in the liver than in the water.

Some flounder were allowed to depurate for up to two weeks. In livers from these fish, monocyclic aromatics were below levels of detectability (40 ppb) within 48 hours. However, a number of unidentified, low-boiling-point components were still detectable in parts per million concentrations after the two-week depuration. These components are presently being identified by mass spectrometry at the National Analytical Facility.

Preserved tissue samples of ovaries, testes and liver from starry flounders exposed prior to spawning (WSF of crude oil--100 ppb monoaromatics) were prepared for histological examination by Michael Bowers. Tissues were stained specifically for examination of lipid distribution in eggs and liver tissue. These slides are now being studied by Dr. Jeannette Whipple for evidence of necrosis and abnormalities in lipids and other cellular structures.

Clams (Tapes semidecussata and Protothaca staminea) exposed prior and during spawning (WSF crude oil--100 ppb monoaromatics) showed evidence of delayed effects on eggs and sperm, with mortality occurring approximately four to seven days after cessation of exposure. Tissues of the hepatopancreas and gonads are being prepared for histological examination.

Analysis of uptake of monoaromatics in the ovaries of the flounders and in clams exposed prior to spawning was completed. Analysis of other components in these tissues and in the livers of flounder is still under way. Of the monoaromatics, toluene was found to accumlate to the highest level in the flounder ovaries (approximately 300 times water concentration) and, of the diaromatics, the napthalenes occurred at the highest levels (approximately 10^3 times the water concentration).

Additional experiments with starry flounder exposed just prior to spawning are being planned for this winter's spawning season. Results of experiments exposing flounder and clams to low chronic levels of the WSF of Cook Inlet crude are being incorporated into a paper on the effects of petroleum on spawning of marine organisms to be presented by Dr. Whipple at the "Conference on Assessment of Ecological Impacts of Oil Spills," sponsored by AIBS in June 1978 at Keystone, Colorado.

* * * * * * * * * *

Dr. Jeannette Whipple and Tom Yocom traveled to Seattle November 29-30 to report progress of the OCSEAP Task with other OCSEAP-funded researchers. Dr. Whipple also presented a new proposal for EPA funding, entitled "Physiological and Genetic Adaptation in Marine Organisms Living in Natural Oil Seep Areas." Mr. Yocom remained after the meeting to participate in a workshop on laboratory studies that should be conducted as part of an oil spill response effort.

PUBLIC AFFAIRS

November 12-13 - Ken Raymond, Scientific Illustrator, together with Sus Kato, Fishery Bilogist at the Tiburon Laboratory, manned a NMFS exhibit prepared by Mr. Raymond at the Fishermens' Festival in Avila Beach, California.

14 - Mr. Tony Spagnolini and class in Commercial Fishing Techniques from Saddleback College, visited the Center for a slide-show talk, discussion of the porpoise/tuna interaction, and a tour of the Center's facilities. Mr. David Holts, Fishing Methods and Equipment Specialist, was the featured speaker.

15 - As part of the Center's participation in the San Diego County's Department of Education "Meet the Scientist Lect-re program," Dr. Paul Smith spoke to 90 students at St. Charles Borromeo Academy on "Fisheries and fishery research in the California Current."

November 16 - Miss Tina Echeverria of Tiburon Laboratory gave a talk on the activities of the Rockfish Analysis Task and Mr. Roger Green described the salmon-rearing project students in Ichthyology from San Francisco State University who were visiting the Laboratory.

18 - Dr. Chester Dorman and students in his geology class visited the Center for a lecture by Forrrest Miller of the Inter-American Tropical Tuna Commission on meteorology and fishery forecasting.

29 - Larry Green, the sportfishing writer, hosted a meeting at the Tiburon Laboratory on the uses of and techniques for fishing with downriggers, a new type of gear for deep-water sportfishing. The meeting was attended by representatives of the press, outdoor journalists, fishing club members, and the interested public.

PRESS RELEASES

November 4 - Southwest Fisheries Center is Site of Colloquium on California Fishery Production.

17 - Research vessel Townsend Cromwell continues resource assessment in Northwestern Hawaiian Islands.

SEMINARS

La Jolla Laboratory

November 21 - Mr. Reuben Araiza, Photographic Artist,presented a slide documentary on "U.S. Baitboat Fishing for Tuna."

Honolulu Laboratory

November 21 - Dr. Edmund Hobson, Tiburon Laboratory, spoke on "Structure of reef fish communities in the Hawaiian Archipelago."

TRAINING

November 7-11 - Nancy K. Wiley, Computer Programmer, Tiburon Laboratory, attended a Civil Service Commission course, "Structured Programming and Design."

November 16-18 - Ms. M. DiBona, Administrative Clerk, La Jolla Laboratory, traveled to San Francisco where she attended a GSA-sponsored course on, "Federal travel regulations."

18 - Mr. Dale Bramble and Ms. Carol Becker, U.S. Civil Service Commission, were the principal speaker at an EEO Seminar at the Southwest Fisheries Center where they discussed Civil Service regulations regarding recruitment of women and minorities.

VISITORS

Honolulu Laboratory

November 2 - Mr. Warren Ketler of Resources Development Associates (RDA), Los Altos, California, met with Mr. Shomura to discuss current research activities in fisheries and aquaculture in the Pacific and Southeast Asia. Mr. Ketler was interested in assessing the status of such activities and also to determine the capacity for research and the potential for enhancement of such capabilities in these areas, in connection with a contract RDA has with the U.S. Agency for International Development.

4 - Capt. Charles K. Townsend, NOAA, Deputy Director, Pacific Marine Center, Seattle, Washington, met with Mr. Shomura to discuss matters pertaining to Cromwell activities.

8 - Dr. James D. Parrish of the Hawaii Cooperative Fishery Research Unit, UH, visited Honolulu Laboratory to meet Mr. Shomura and to discuss fisheries matters of mutual interest.

14 - Dr. Dayton L. Alverson, Director, Northwest and Alaska Fisheries Center. Dr. Alverson was in Honolulu to attend the Law of the Sea Institute Conference.

22 - Mr. John C. Marr, International Center for Living Aquatic Resources Management, Manila, Philippines, visited the Laboratory; he was in Honolulu primarily to attend the Law of the Sea Institute Conference.

28-30 - Mr. David Mackett, Center Planning Officer, and Mr. Arthur Saltzman, Potomac Research, Inc., were at Honolulu Laboratory to discuss the development of a fishery management information system.

November 28 - Mr. Ryoji Saito, Japan Marine Fishery Resource Research Center (JAMARC) visited Mr. Otsu. Mr. Saito was en route home to Japan after spending 5 months in Micronesia (Saipan, Palau, Majuro, etc.) on a baitfish survey and experimental skipjack tuna fishing program.

La Jolla Laboratory

November 2 - Mr. Ben Darvy, Personnel, Department of Commerce, Washington, D.C.

4 - Mr. Colin L. Campbell, Naval Weather Service Facilities, Naval Air Station, North Island.

- Mr. Robert L. Jones, National Defence Headquarters, Ottawa, Ontario, Canada.

- Mr. Douglas A. Winge, Naval Weather Service Facility, Naval Air Station, North Island.

7 - Deborah Spero Smith and Michelle Oppenheimer, Department of Commerce, Office of Personnel, Washington, D.C., members of DOC Personnel Management Evaluation Review Team.

17 - Dale C. Gough, NMFS, NASO, Seattle.

Tiburon Laboratory

November 2 - Fred Kellenberger, SWFC, La Jolla, California.

- Arthur Saltzman, Potomac Research, La Jolla, California.

- Richard Schnurr, U.S. Department of Commerce, Washington, D.C.

8 - Steve Taylor, California Department of Fish and Game, Sacramento, California.

- Paul Jensen, California Department of Fish and Game, Sacramento, California.

- Frank M. Corbelli, Tyee Club, San Francisco, California.

- George L. Ford, Tyee Club, San Francisco, California.

- Stan Hearst, Tyee Club, San Francisco, California.

- J. von Nostich, Tyee Club, San Francisco, California.

November 8 - Frank Dyer, Tyee Club, San Francisco, California.

- Ed Conlan, Tyee Club, San Francisco, California.

9 - Margaret Bradbury, San Francisco, State University, San Francisco, California.

11 - Glenn R. Van Blaucom, U.S. Fish and Wildlife Service, San Simeon, California.

- Stan Rice, NMFS, Auke Bay Laboratory, Auke Bay, Alaska.

- David Deuel, NMFS, Narrangansett, Rhode Island.

15 - John H. Klein, Pt. St. George Fisheries, Santa Rosa, California.

17 - R. J. Supp, Massey Data, San Francisco, California.

J. B. Ragan, Imagineering Associates, San Rafael, California.

- Susan Hatfield, California Department of Fish and Game, Menlo Park, California.

25 - Susan Capalbo, University of California, Davis, California.

27 - Captain R. Wallace Lawson, National Geographic Magazine, Berkeley, California.

28 - Howard Smalheiser, College of Marin, Kentfield, California.

- Barney Cole, U.S. Navy Antifouling Research Center, San Diego, California.

29 - Bill Jesson, R. J. de Recat & Co., San Rafael, California.

- Joe Federico, Simco/American Sport, Hayward, California.

- Renee Misiner, Simco/American Sport, Hayward, California.

- Bill Konde, Tyee Club, San Francisco, California.

- Ed Conlan, Tyee Club, Daly City, California.

- Mark Schmittger, Simco/American Sport, Hayward, California.

- Ed Neal, San Francisco Examiner, San Francisco, California.

Pacific Environmental Group

November 1 - Mr. Fred Kellenberger, SWFC, La Jolla, California.

- Art Saltzman, Potomac Research Corporation, La Jolla, California.

14-16 - J.F.T. Saur, Scripps Institution of Oceanography, La Jolla, California.

15 - Herb Jaenicke, NWAFC, Auke Bay, Alaska.

28 - Forrest Miller, Inter-American Tropical Tuna Commission, La Jolla, California.

MEETINGS AND TRAVEL

Southwest Fisheries Center is Site of Colloquium on California Fishery Production

Sponsored by the American Institute of Fishery Research Biologists, Southern California District, a colloquium on "California Fishery Production" was organized and chaired by Dr. Paul Smith, fishery research biologist at the La Jolla Laboratory, at the Center on November 8.

The Colloquium, dealt with the productivity of California's fisheries: the economic productivity which results from California's fisheries; the primary (algal) productivity of the ocean areas; and the fish production of California-based fleets.

California has the major fishery port in the United States, San Pedro. The port leads the country's fish ports both in total tonnage landed and in the dollar value of the fish landed. In 1976, San Pedro landed 300,000 metric tons with a dock-side value of $117 million. Dock-side values and tonnages are not the entire story of the productivity of the California fisheries. Major considerations in the total story are the costs of obtaining the catch, economic activity which is a direct and indirect consequence of the fishery industry in this area, distribution and variability of the fishery production, and the primary production on which fisheries ultimately depend.

Three speakers at this Colloquium expanded on these points to identify the issues concerned with maintaining, restoring and increasing the abundance of fish species on which the fisheries depend. Dr. Daniel Huppert, Leader of the Commercial and Recreational Fisheries for Management program at the La Jolla Laboratory, represented the point of view of the fishery economist in describing the economic productivity and the costs of fishing operations; Mr. Witold Klawe of the Inter-American

Tropical Tuna Commission discussed the basic fishery productivity and fish removal from the ocean; Mr. Sargun Ali Tont of the University of California's Institute of Marine Resources at the Scripps Institution of Oceanography talked about the basis for all production--the production of green plants, the algae of the open sea over the marine areas from which come California's fish.

November 1 - Mr. R. Shomura, Director, returned to Honolulu from Cochin, India, where he participated in the Indian Ocean Fishery Commission meeting (travel dates October 16-November 1).

- Mr. Roger Green, Tiburon Laboratory, visited Weyerhauser Corporation's new salmon-rearing facilities at Springfield and Newport, Oregon.

1-2 - Data Systems Manager Fred Kellenberger, SWFC, traveled to Monterey and Tiburon to attend Fishing Information Systems meetings.

2-4 - Ms. Jackie Jennings, Fishery Biologist at the La Jolla Laboratory, traveled to Seattle and Pullman, Washington to discuss freeze branding of porpoise.

3 - Mr. Shomura and Mrs. Godfrey of the Honolulu Laboratory, attended a Hawaii Department of Commerce managerial and supervisory personnel luncheon at the Oceania Floating Restaurant; Mr. John M. Golden, Director of Personnel, Department of Commerce, Washington, D.C. addressed the group.

4 - Mr. Heeny Yuen, substituting for Honolulu Director Shomura, attended the Marine Affairs Coordinator's meeting of fishing industry representatives called by Dr. Stan Swerdloff to organize and initiate legislation on fisheries.

5-15 - Drs. Fox, G. Sakagawa and N. Bartoo in Madrid, Spain to attend meetings of the Standing Committee for Research and Statistics of the International Commission for the Conservation of Atlantic Tuna (ICCAT).

6 - Mr. Shomura traveled to Terminal Island, California, to attend a 1-day meeting at the Southwest Region to discuss Center-Region relationship and the Fisheries Development Program for the Southwest Region.

November 7 - Center Director I. Barrett at Southwest Region, Terminal Island to attend Region/Center meeting.

8 - Mr. Barrett at the Tiburon Laboratory to discuss scientific and administrative matters with Tiburon Laboratory Director and staff.

- Mr. Tamotsu Nakata, Scientific Illustrator at the Honolulu Laboratory attended a 1-day Graphic Arts Seminar in Portland, Oregon. He also visited nearby fish hatcheries and the Northwest and Alaska Fisheries Center, Seattle, Washington.

8-10 - Dr. M. Laurs, La Jolla Laboratory, traveled to Portland Corvallia, Oregon to attend the Pacific Marine Fisheries Commission Albacore Meeting and to deliver albacore blood samples and complete analysis at Oregon State University.

10-11 - Organized by Mr. Howard Ness, Chief of the Fisheries Development Division, Southwest Region, Terminal Island, a Fisheries Development Conference, was held at the SWFC. Conference participation included NMFS Center and laboratory staff members nation-wide who are actually participating in fishery development programs. Mr. Sus Kato of the Tiburon Laboratory represented the Center.

- Dr. Joe Powers, La Jolla Laboratory, traveled to Logan, Utah to discuss the line transect analysis from the aerial/shipboard survey.

13-16 - Lt. W. Perryman, NOAA Corps Officer detailed to the Porpoise/Tuna interaction program at the La Jolla Laboratory, traveled to Honolulu to brief officers and the scientific party of the NOAA research vessel Townsend Cromwell on sighting forms, species characteristics, and the importance of sightings of marine mammals in the central Pacific.

14 - Mr. Shomura departed Honolulu to attend a meeting in Suva, Fiji, November 17-25, sponsored by the South Pacific Bureau for Economic Cooperation to discuss organization of a regional fisheries agency; he returned to Honolulu on November 25.

- Mr. Ed Ueber, Tiburon Laboratory, attended a meeting in Los Angeles of the Dungeness Crab Management Development Team.

November 14-15 - Messrs. I. Barrett, D. Huppert, G. Stauffer and Ms. J. McMillan traveled to Los Angeles to attend the Pacific Fisheries Management Council and Scientific and Statistical Committee meetings.

17 - Dr. P. Smith, Fishery Biologist at the La Jolla Laboratory, in Ensenada, Mexico to examine 1977 year class anchovy in Mexican catch relative to the 1976 year class and also to talk to Mexican acousticians about sonar surveys.

22-23 - Dr. Andrew Dizon and Mr. Bernard Ito participated in a 2-day Histamine Workshop arranged by Dr. Hilmer A. Frank, University of Hawaii Food Science Department. The workshop was held in the Honolulu Laboratory conference room.

November 27-
December 1 - Mr. Shomura also attended the Western Pacific Regional Fishery Management Council meeting at the State Capitol and participated in the Scientific and Statistical Committee meeting in the Honolulu Laboratory conference room on November 30.

28-30 - Dr. R. Lasker traveled to Washington, D.C. at attend the Ocean Sciences Board meeting and the IDOE Advisory Committee for Ocean Sciences meeting.

PERSONNEL

Honolulu Laboratory

November 3 - Jose Enitan, Biological Aid (Microbiology), completion of earlier 700 hour appointment.

- Jeffrey Sampaga, Biological Aid (Microbiology), completion of earlier 700 hour appointment.

20 - Roy Mendelssohn, Operations Research Analyst, Promotion.

21 - James C. Cooper, Biological Technician (Fisheries), 700 hour appointment, part time.

- Fletcher Riggs, Fishery Biologist (Research), career conditional appointment.

22 - Henry Kishinami, Biological Aid (Fisheries), 700 hour appointment, part time.

Tiburon Laboratory

November 7 - Chet Chaffee, Biological Aid, Temporary Appointment.

20 - John Thomas Barnes, Biological Technician, Reassignment from Honolulu Laboratory to Tiburon Laboratory.

- Susumu Kato, Fishery Biologist, Promotion.

UNITED STATES
DEPARTMENT OF COMMERCE

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL MARINE FISHERIES SERVICE
SOUTHWEST FISHERIES CENTER
8604 LA JOLLA SHORES DRIVE
P.O. BOX 271
LA JOLLA, CALIFORNIA 92038

OFFICIAL BUSINESS

PENALTY FOR PRIVATE USE, $300

AN EQUAL OPPORTUNITY EMPLOYER

POSTAGE AND FEES PAID
DEPARTMENT OF COMMERCE
210

THIRD CLASS